

Defense Sciences Office

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Formed in 1958 to **PREVENT** and **CREATE** strategic surprise.

Capabilities, mission focused

Finite duration projects

Diverse performers

Multi-disciplinary approach...from
basic research to system engineering

Making pivotal early investments that change what's possible...



Who we are:

- A collaborative team of diverse, opportunistic technology entrepreneurs
- “DARPA’s DARPA” – office that creates DoD opportunity from fundamental scientific discovery
- Informed, but not constrained, by current trends and conflicts

What we do:

- Invest in multiple, often disparate, scientific disciplines
- Reshape existing fields or create entirely new disciplines (sometimes when the payoff to DoD may not be fully understood)
- Harvest and accelerate the development of promising breakthroughs to create enabling technologies for broad impact against national security challenges

The Nation’s first line of defense against scientific surprise



DARPA Technical Offices

BTO

DSO

I2O

MTO

STO

TTO

Biology,
Technology &
Complexity

Discover, Model,
Design & Build

Information,
Innovation &
Cyber

Electronics,
Photonics &
MEMS

Networks, Cost
Leverage &
Adaptability

Weapons,
Platforms &
Space

Restore and
Maintain
Warfighter
Abilities

Harness
Biological
Systems

Apply Biological
Complexity at
Scale

Physical
Sciences

Mathematics

Transformative
Materials

Supervised
Autonomy

Novel Sensing
and Detection

Harnessing
Complexity

Cyber

Data Analysis at
Massive Scales

ISR
Exploitation

Biological
Platforms

Computing

Electronic
Warfare

Manufacturing

Novel Concepts

Photonics

Positioning,
Navigation and
Timing

Thermal
Management

Battle Mgmt,
Command &
Control

Comms &
Networks

ISR

Electronic
Warfare

Positioning,
Navigation and
Timing

Air Systems

Ground
Systems

Marine Systems

Space Systems



Major Factors Shaping DARPA Investments Today

Wide range of national security challenges: evolving nation states, shifting networks

Powerful, globally available technologies set a fast pace

Military systems' cost, pace, and inflexibility limit our operational capabilities



National Security Challenges



- Wide range of national security challenges: evolving nation states, shifting networks
 - Can we counter the diversity of national security threats by rapidly accelerating scientific discovery and innovation?
 - Can we better detect and manage CBRNE materials to counter threats arising from the erosion of boundaries?
- Powerful, globally available technologies set at a fast pace
 - Can we speed the creation of new capabilities and remove technology barriers to rapid or low volume production?
- Military systems' cost, pace, and inflexibility limit our operational capabilities
 - Can we harness complexity and manage uncertainty/risk in the systems we build?



???

(Tell us what you think they are)



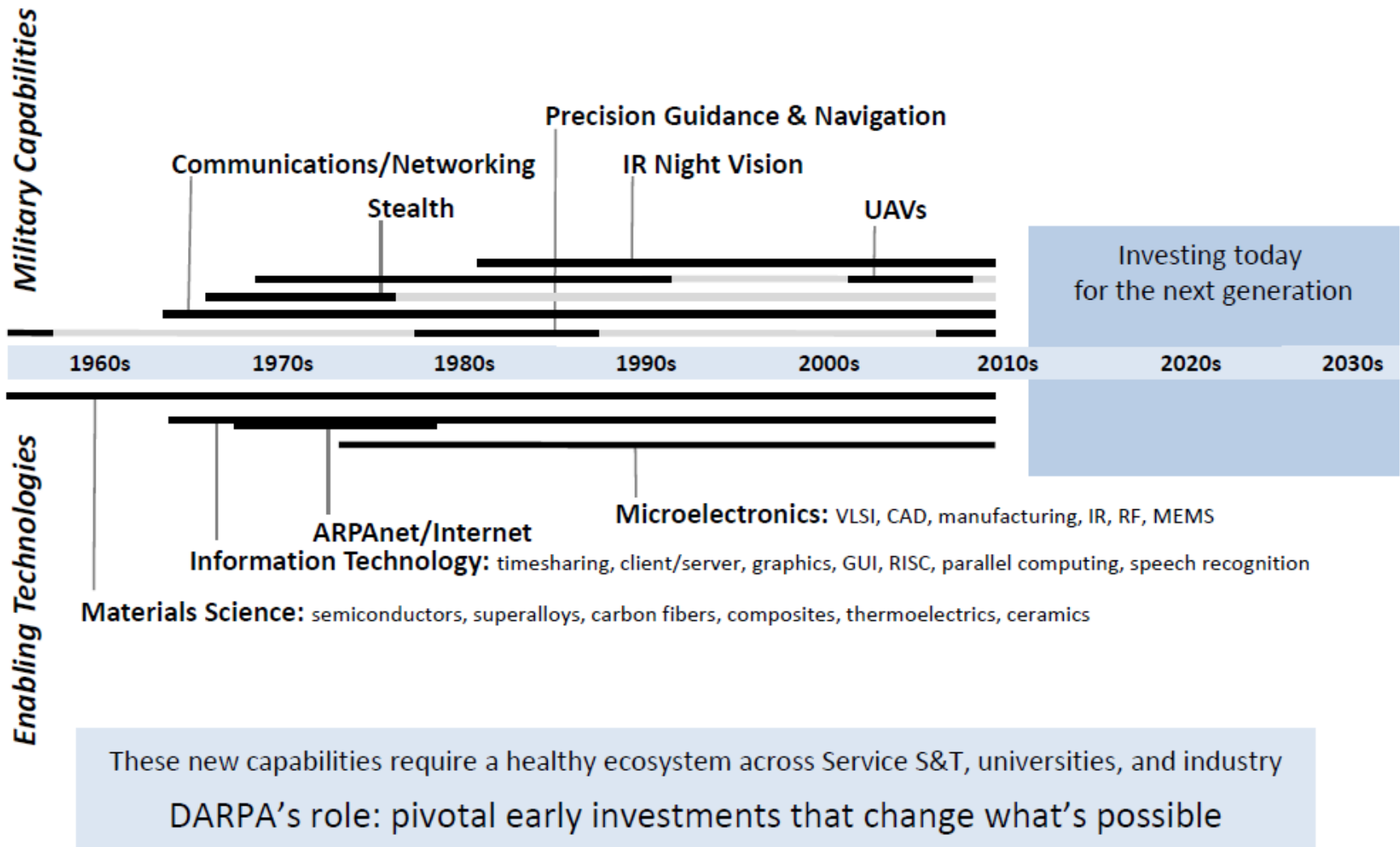
We look forward to your ideas.



Backups



Mission: Breakthrough Technologies for National Security





Program Managers



Fariba Fahroo
Mathematics



Mark Micire
Robotics



James Gimlett
Physics



Prem Kumar
Quantum and Nonlinear Optics



Judah Goldwasser
Structural Materials



Doran Michels
Ground Combat Systems



Michael Maher
Materials and Manufacturing



Gill Pratt
Robotics and Neuromorphic Systems



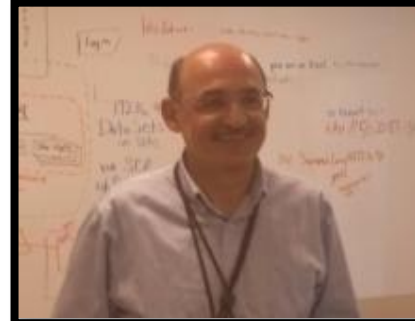
John Main
Material System Innovation



Tyler McQuade
Chemistry



Predrag Milojkovic
Imaging and Optics
Distribution Statement "A" (Approved for Public Release, Distribution Unlimited)



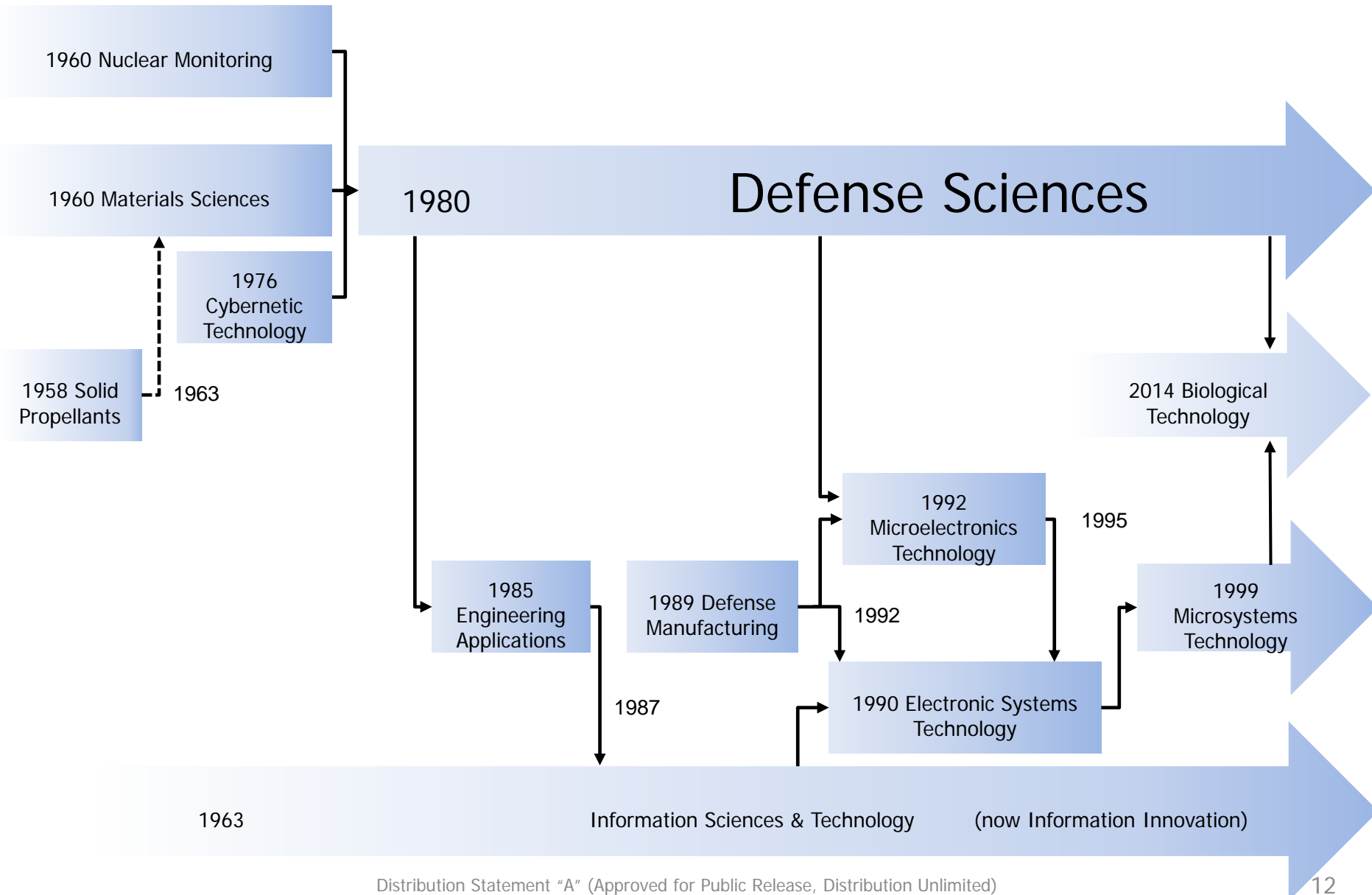
Reza Ghanadan
Complexity Science



Vincent Tang
Applied Physics



DSO Office History



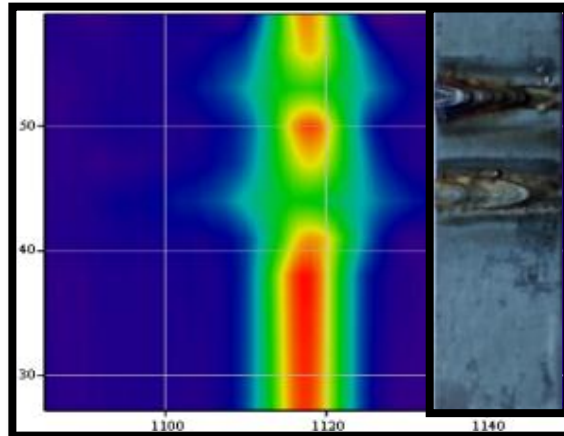


Topic Areas



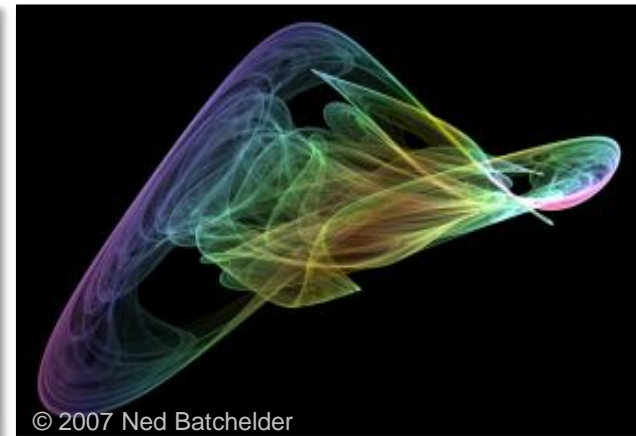
Supervised Autonomy

Development of theory, tools, and components to enable extended autonomous activity in unstructured, infrastructure-poor environments



Novel Sensing and Detection

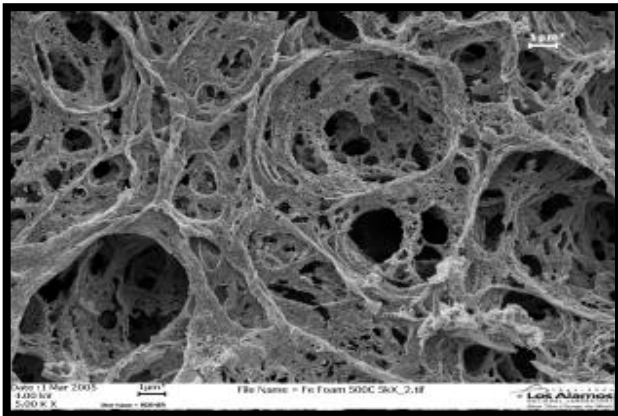
New approaches to sensing and detecting CBRNE materials and devices



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Harnessing Complexity

Exploration of the science of complexity, and its application to new engineering paradigms



Transformative Materials

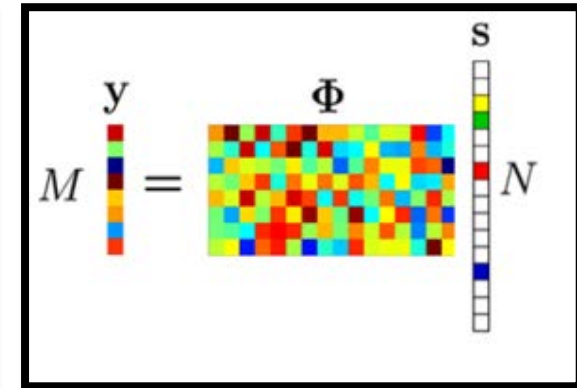
Decoupling and control of countervailing material properties; design and fabrication of new materials across multiple length scales



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Physical Sciences

Exploration of scientific breakthroughs and boundaries that enable unique capabilities for national security



Mathematics

Development of advanced mathematics and modeling tools